

What is claimed is :

1) A combiner, comprising:

a common port;

a plurality of cavity resonators;

a plurality of apertures; and

a combining mechanism operably connected to said common port and coupled to said plurality of cavity resonators through said apertures.

2) The combiner according to claim 1, wherein said combining mechanism comprises:

at least one junction to combine signals from at least one pair of said cavity resonators, wherein said at least one junction is operably connected to said common port; and

a transmission line operably connected between each of said apertures and said junction, wherein a line length of said transmission line is equal to or less than a quarter-wavelength.

3) The combiner according to claim 1, wherein said a plurality of cavity resonators comprise:

at least one edge pair of cavity resonators; and

a central pair of cavity resonators, wherein said outputs of said edge pair of resonators are operably connected to said common port through half-wave transmission lines and said center pair of resonators is operably connected to said central junction.

4) The combiner according to claim 1, further comprising:

at least one sliding cover located over at least one of said apertures;

at least one free-rotating screw operably connected to said sliding cover, whereby said aperture is adjusted by moving said sliding cover; and

at least one locking screw, wherein said sliding cover is secured over said aperture by said locking screw.

- 5) The combiner according to claim 2, wherein said combining mechanism is coupled to said plurality of cavity resonators through a distance between 0.06 to 0.15 inches.
- 6) The combiner according to claim 2, wherein said combining mechanism is a stripline network.
- 7) The combiner according to claim 2, wherein said cavity resonators are ceramic.
- 8) The combiner according to claim 2, further comprising a balancing capacitor operably connected to said at least one junction to cancel phase imbalance.
- 9) The combiner according to claim 2, further comprising:
- at least one sliding cover located over at least one of said apertures;
  - at least one free-rotating screw operably connected to said sliding cover, whereby said aperture is adjusted by turning said screw, whereby said sliding cover is moved; and
  - at least one locking screw, wherein said sliding cover is secured over said aperture by said locking screw.
- 10) The combiner according to claim 3, wherein said combining mechanism comprises:
- at least one junction to combine signals from said edge pair of cavity resonators, wherein said at least one junction is operably connected to said common port through said half-wave transmission lines; and
  - a transmission line operably connected between each of said apertures and said junction, wherein a line length of said transmission line is equal to or less than a quarter-wavelength.
- 11) The combiner according to claim 10, further comprising:
- at least one sliding cover located over at least one of said apertures;

at least one free-rotating screw operably connected to said sliding cover, whereby said aperture is adjusted by turning said screw, whereby said sliding cover is moved; and

at least one locking screw, wherein said sliding cover is secured over said aperture by said locking screw.

12) The combiner according to claim 10, wherein said combining mechanism is coupled to said plurality of cavity resonators through a distance between 0.06 to 0.15 inches.

13) The combiner according to claim 10, wherein said combining mechanism is a stripline network.

14) The combiner according to claim 10, wherein said cavity resonators are ceramic.

15) The combiner according to claim 10, further comprising a balancing capacitor operably connected to said at least one junction to cancel phase imbalance.

16) The combiner according to claim 11, wherein said combining mechanism is coupled to said plurality of cavity resonators through a distance between 0.06 to 0.15 inches.

17) The combiner according to claim 11, wherein said combining mechanism is a stripline network.

18) The combiner according to claim 11, wherein said cavity resonators are ceramic.

19) The combiner according to claim 11, further comprising a balancing capacitor operably connected to said at least one junction to cancel phase imbalance.

20) A method of combining a plurality of signals, comprising the steps of:  
coupling said signals through apertures; and

combining said signals into pairs of signals using equal to or less than quarter-wavelength transmission lines.

21) The method according to claim 20, further comprising the step of:  
combining said pairs of signals using half-wavelength transmission lines.

22) The method according to claim 20, wherein said step of coupling said signals, comprises adjusting said coupling by:  
rotating a screw;  
adjusting a sliding cover; and  
securing said sliding cover.

23) The method according to claim 21, wherein said step of coupling said signals, comprises adjusting said coupling by:  
rotating a screw;  
adjusting a sliding cover; and  
securing said sliding cover.